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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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DORSEY & WHITNEY LLP
INTELLECTUAL PROPERTY DEPARTMENT
SUITE 3400
1420 FIFTH AVENUE
SEATTLE, WA 98101

EXAMINER

HASSANZADEH, PARVIZ

ART UNIT PAPER NUMBER

1763

DATE MAILED: 12/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/916,164

Applicant(s)

SABDE ET AL.

Examiner

Parviz Hassanzadeh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 November 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 60-105 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 60-105 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 July 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11/10/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 11/10/04 have been fully considered but they are not persuasive.

Applicants assert that Molnar does not disclose the lubricating planarizing solution having a viscosity of at least 4 cp.

Examiner argues that according to disclosure of the present application on page 8, a concentration of 0.1-10% POLYOX or CARBOGEL or 5-20% glycerol or a glycol would correspond to the claimed viscosity of at least 4 cp. Molnar teach the concentration of lubricant may be 0.1 to 15 of even outside the is range (column 26, lines 9-23).

Applicant assert that Wijekon et al does not teach a non-abrasive solution.

Examiner argues that one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). In the present case Wijekon et al has been relied upon for teach a dispensing mechanism capable of dispensing two solution onto a polishing pad, whereas Molnar has been relied upon for teaching particular type of solutions to be dispensed onto a polishing pad.

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 130 as recited on

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page 6, line 28 115 as recited on page 9, line 12 and thereafter. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 134, 135, 136, 137, 138, 139 as appear in Fig. 3. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

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The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 60 and 62-83 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 60 the limitation "at least approximately between 4-100 cp" is vague since the term "at least" defines an open end range while the word "between" defines a close range. For the purpose of the examination, it has been interpreted as "at least 4 cp".

Claim Rejections - 35 USC § 102

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 60 is rejected under 35 U.S.C. 102(e) as being anticipated by Molnar (US Patent No. 6,634,927 B1).

Molnar teaches (Figs. 1-3) a support table 40, a polishing pad on the support table, the polishing pad 26 having a body, a planarizing surface on the body, and a plurality of abrasive particles fixed/attached to the body at the planarizing surface; a carrier assembly having a carried head 16 configured to hold a substrate assembly and a drive mechanism (motor) (column 7 line 20 through column 12, line 23) attached to the carrier head to move the carrier relative to the polishing pad; and a non-abrasive lubricating planarizing solution without abrasive particles on

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the polishing pad (col. 8 lines 30-36). Molnar further teaches a non-abrasive lubricating solution wherein various solutions are discussed (column 26, line 9 through column 29, line 12).

Regarding the viscosity of the lubricating solution : The concentration of lubricant is from 0.1 to 15%. Lubricant concentration outside this range are currently believed to be useful (viscosity of 4-100 cp) (column 26, lines 10-23).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 61, 84-105 are rejected under 35 U.S.C. 103(a) as being unpatentable over Molnar (US Patent No. 6,634,927 B1) in view of Wijekoon et al (US Patent No. 6,572,453 B1).

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Molnar teaches all limitations of the claims as discussed above except for explicit disclosure of a mixing site coupled to the solution and the lubricant and being coupled to a nozzle to dispense the mixed solution onto the polishing pad.

Wijekoon et al teach a multi-fluid polishing processing apparatus (Fig. 1) including a fluid arm 25 comprising a polishing fluid supply line 25a coupled to a polishing fluid source 26a and a conditioning chemical fluid supply line 25b coupled to a conditioning fluid source 26b for dispersing solution onto a polishing pad 17, wherein the conditioning fluid and the polishing fluid may be introduced via a single line, either from a single source, or from individual sources, and may or may not be premixed (column 2, line 52 through column 3, line 60).

The motivation to provide the apparatus of Molnar with a multi-fluid polishing process is that it allows a plurality of polishing fluids to be added to the process in-situ and mixed prior to contacting the wafer in the polishing process. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to provide the apparatus of Molnar with a multi-fluid polishing process.

Further regarding claims 84-105:

Molnar fails to expressly teach the use of ammonia, though ammonia is a known cleaning agent with chemical and physical properties that make it desirable to utilize in a polishing environment.

Molnar fails to teach that the lubricating solution comprises the components as claimed. However, Molnar does teach that the lubricant is made of a sulfurized fatty acid soaps. Glycerol (regarding claims 84 and 86) is a suitable type of soap and is well known for its chemical and physical properties.

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Molnar also teaches that the lubricating solution comprises glycols made of propylene glycol or polymer and copolymers and mixtures thereof see the sentence joining col. 27 and 28. It is even noted that polypropylene (regarding claims 88, 90, and 92) is a preferred finishing aid in col. 27 lines 48-50.

Regarding claim 96: Molnar does specifically claim polyvinyl alcohol as a lubricating solution, but does cite the use of alcohols in col. 28 lines 17-25.

Regarding mixing the solutions with ammonia. Ammonia is a known cleaning agent with chemical and physical properties that make it desirable to utilize in a polishing environment. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to use glycerol and polypropylene glycol as the non-abrasive lubricating planarizing solution as the lubricant in aqueous solution of ammonia as claimed.

Claim 62-83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Molnar (US Patent No. 6,634,927 B1).

Regarding claims 62, 64, 84, and 86: Molnar fails to teach that the non-abrasive lubricant comprises glycerol.

Molnar does teach that the lubricant is made of a sulfurized fatty acid soaps. Glycerol is a suitable type of soap and is well known for its chemical and physical properties.,

Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to use glycerol as the non-abrasive lubricating planarizing solution as the lubricant.

Regarding claims 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, and 83: Molnar fails to teach the specific viscosity of the lubricating solution. However, the resulting viscosity of a solution is a

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result-effective or optimizable parameter well known in the field of solution chemistry. The motivation to provide a mixture with a viscosity of 10-20cP or 10-100cP is that this viscosity will ensure that the polishing surface is adequately buffered from the wafer to prevent over polishing or damaging the wafer and thus causing an undesirable result.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Parviz Hassanzadeh whose telephone number is (571)272-1435. The examiner can normally be reached on Tuesday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (571)272-1439. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

P. Hassanzadeh
Parviz Hassanzadeh
Primary Examiner
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December 14, 2004